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| EXAMINER |
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JONES, JUDSON

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| ART UNIT | PAPER NUMBER |
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2834

DATE MAILED: 10/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/869,268

Applicant(s)

YAMAMOTO ET AL.

Examiner

Judson H Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-10 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. "Efficient Cylindrical Linear Motor" is suggested.

Drawings

Figures 14 and 15 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figures 14 and 15 are from Japanese reference 10-118358. This Japanese reference is owned by the same Assignee as the instant invention, is the work of both the inventors of the instant invention along with a third inventor and was published after the filing date of the instant invention's Japanese priority document. While it may not legally be prior art, it is not part of the instant invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4-6, 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 10 are missing several articles, such as "A linear motor, comprising a movable unit in cylindrical shape having (its) central axis at the intersection

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of (an) X-axis and Y-axis, an inner yoke arranged on (the) inner side of the movable unit with a given spacing in (the) radial direction ...” Also, the phrase “and having high magnetic permeability in parallel...” is unclear. This phrase could refer back to the thin plates, the inner yoke or the movable unit. Further down in both claims, the phrase “with a given spacing in radial direction of the movable member” is unclear. Spacing is a distance between two objects.

Applicant mentions the movable member, which is a second object, but does not specify that the spacing is between the outer yoke and the movable member. Also in both claims there is the phrase “arranging two slots.” Arranging appears to be an incorrectly used word. Once the slots are created, they are fixed in location. The phrase “permanent magnets magnetized in a direction to connect the inner yoke with the outer yoke” is unclear. The magnets do not physically connect the inner and outer yokes. The connection is magnetic, with flux lines flowing between the inner and outer yokes.

Claims 2, 4-6 and 8 also have missing articles.

In claim 2, Applicant recites “a pair of permanent magnets” without making clear if these magnets are the same pair of magnets recited in claim 1 or if there is an additional set of magnets with opposite directions of polarity.

In claim 6, the phrase “the two inner yokes are integrated by two inner yoke support members” is unclear. The word “integrated” seems to be used incorrectly here.

In claim 8, the phrase “two outer yokes are integrated by two outer yoke support members” is unclear. The word “integrated” seems to be used incorrectly here.

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Redlich in view of Takahashi et al. Redlich discloses a linear electromagnetic transducer with a cylindrically shaped movable unit 55, an inner yoke 58 formed from laminated plates, an outer yoke formed from laminated plates, a base for holding the inner yoke and outer yoke, bearings and a pair of permanent magnets 53, 55 with opposing magnetic poles but does not disclose first, second and third magnetic poles on the outer yoke with a coil wound around the second magnetic pole. Redlich uses two poles on the outer yoke with a coil wound between the poles. However Takahashi et al. discloses a three pole outer yoke structure with a coil wound on the second pole in figures 6a and 7a for the purpose of increasing the power of the motor. Since Redlich and Takahashi et al. are both from the same field of endeavor, it would have been obvious at the time

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the invention was made for one of ordinary skill in the art to have utilized a three pole outer yoke structure in the linear motor of Redlich in order to increase the power of the device.

In regard to claim 2, Takahashi et al. discloses a pair of magnets in figures 6a and 7a.

In regard to claim 3, Takahashi et al. teaches making an outer yoke by laminating a multiple of thin plates of the same shape and the same dimension as shown in figures 5 and 6 but does not disclose making a inner yoke by the same procedure. As shown in figure 3, the inner yoke laminations all have a central cross bar where the winding is placed. Therefore as one goes from the center of the circle toward the edges, the laminations have to be made smaller. However when one produces a three pole yoke as taught by Takahashi et al., there is no longer any need for the cross piece as shown in figure 3 of Redlich. It would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized identical laminations for the inner yoke and identical laminations for the outer yoke in the device of Redlich as modified by Takahashi et al. in order to reduce the cost of the device.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Redlich in view of Takahashi et al. as applied to claims 1 and 2 above, and further in view of Morita et al. Redlich as modified by Takahashi et al. discloses the linear motor with two outer yokes arranged symmetrically with the Y axis as shown in figure 6 but does not disclose the yokes joined by two outer yoke support members. Morita et al. discloses connecting twelve outer yokes together by means of support members 90, 101 as shown in figure 10. Ten of the twelve outer yokes in Morita et al. are arranged symmetrically with respect to the Y axis. Since Morita et al. and Redlich as modified by Takahashi et al. are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have

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utilized the outer yoke supports of Morita et al. in the device of Redlich as modified by Takahashi et al. because the Redlich as modified by Takahashi et al. device does not teach any way of supporting an annular yoke.

In regard to claim 9, see Morita et al. column 8 lines 1-7 where Morita et al. teaches making the supports from resin.

Allowable Subject Matter

Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, provided the 35 USC 112 rejections of independent claims 1 and 2 and dependent claims 4-6 are overcome.

The following is a statement of reasons for the indication of allowable subject matter: In claim 4 Applicant is manipulating four variables, the radius of curvature of the inner periphery of the outer yoke, the radius of curvature of the inner periphery of the slot, the radius of curvature of the outer periphery of the slot and the radius of curvature of the outer periphery of the outer yoke. There is no teaching or suggestion in the prior art that manipulating those four variables would produce an optimized motor.

In regard to claim 5, Applicant is manipulating three variables, the outer peripheral end of the laminations of the inner yoke, the inner peripheral end of the laminations of the outer yoke and the end surface of the permanent magnet. There is no teaching or suggestion in the prior art that manipulating those three variables would produce an optimized motor.

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In regard to claim 6, the prior art of record does not disclose or teach two inner yokes arranged symmetrically with respect to the Y axis and joined by two support members positioned separately in the direction of the Y axis.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reichel discloses a support structure for a motor similar to the one disclosed by Morita et al. The Japanese references were listed in the PCT search report as background documents.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H Jones whose telephone number is 703-308-0115. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 703-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JHJ
October 3, 2002

Judson Jones
AU 2834